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BULLETIN OF THE  
UNIVERSITY OF NEW HAMPSHIRE

Graduate School Number



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## BULLETIN OF THE UNIVERSITY OF NEW HAMPSHIRE

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The Bulletin is published in September, October, November, December, January, February, March, and April, and includes:

- The Catalog of the University
- The Report of the President
- The Financial Report
- The Catalog of the Summer School
- The Pictorial Folder
- The Catalog of the Graduate School

and other publications of the University.





# UNIVERSITY CALENDAR

1936-37

## SUMMER SESSION

1936

June 29	Monday	Registration Day
June 30	Tuesday	Classes begin at 7:30 A.M.
Aug. 7	Friday	Summer Session closes at 4 P.M.

## FIRST SEMESTER

1936

Sept. 15	Tuesday	Matriculation Day—Freshman Class
Sept. 21	Monday	Registration Day—Upper Classes
Sept. 22	Tuesday	Recitations begin at 8 A.M.
Sept. 23	Wednesday	University Day—Afternoon holiday
Oct. 10	Saturday	Home-coming Day
Oct. 16	Friday	Annual Meeting of Board of Trustees
Nov. 13	Friday	Mid-Semester warnings to be filed, 5 P.M.
Nov. 14	Saturday	Dads' Day
Nov. 25	Wednesday	Thanksgiving recess—Wed., 12:30 P.M. to Mon., 8 A.M.
Dec. 23	Wednesday	Christmas Recess begins at 12:30 P.M.

1937

Jan. 4	Monday	Christmas Recess ends at 8 A.M.
Jan. 15	Friday	Meeting of Board of Trustees
Jan. 22-29	Fri.-Fri.	First Semester examinations

## SECOND SEMESTER

Feb. 1	Monday	Registration Day—All Classes
Feb. 2	Tuesday	Recitations begin at 8 A.M.
Feb.	Friday	Winter Carnival, Fri., 12:30 P.M., to Sat., 12:30 P.M.

## UNIVERSITY OF NEW HAMPSHIRE

Mar. 9	Tuesday	Town Meeting
Mar. 27	Saturday	Spring Recess begins at 12:30 P.M.
Apr. 5	Monday	Spring Recess ends at 8 A.M.
Apr. 16	Friday	Meeting of Board of Trustees
Apr. 16	Friday	Mid-Semester warnings to be filed, 5 P.M.
May 22	Saturday	Mothers' Day
June 2-9	Wed.-Wed.	Second Semester examinations
June 12	Saturday	Alumni Day—Meeting of Board of Trustees
June 13	Sunday	Baccalaureate Exercises
June 14	Monday	Class Day Exercises, 10:00 A.M. Commencement, 3:00 P.M.

## SUMMER SESSION

1937

June 28	Monday	Registration Day
June 29	Tuesday	Classes begin at 7:30 A.M.
Aug. 6	Friday	Summer Session closes at 4 P.M.

## BOARD OF TRUSTEES

HIS EXCELLENCY, GOVERNOR H. STYLES BRIDGES, A.M., LL.D., *ex officio*

PRESIDENT EDWARD M. LEWIS, A.M., LITT.D., LL.D., *ex officio*

ANDREW L. FELKER, Commissioner of Agriculture, *ex officio*

ROY D. HUNTER, *President* West Claremont  
June 14, 1916 to June 30, 1937

HARRY D. SAWYER Woodstock  
September 15, 1926 to June 30, 1938

JAMES A. WELLMAN, B.S. Manchester  
January 26, 1928 to June 30, 1939

ROBERT T. KINGSBURY Keene  
January 27, 1928 to June 30, 1936

JOHN W. PEARSON, A.B. Concord  
January 26, 1928 to June 30, 1936

\*CHARLES H. HOOD, B.S., D.SC. Boston, Massachusetts  
May 6, 1929 to June 30, 1939

GEORGE T. HUGHES, A.M., LL.D. Dover  
July 1, 1931 to June 30, 1939

\*JOHN S. ELLIOTT, B.S., *Secretary* Madbury  
July 1, 1932 to June 30, 1936

JESSIE DOE Rollinsford  
July 1, 1932 to June 30, 1938

JOHN T. DALLAS, A.B., D.D., LL.D. Concord  
July 1, 1933 to June 30, 1937

\*Elected by Alumni.

## OFFICERS OF ADMINISTRATION

EDWARD M. LEWIS, A.M., LITT.D., LL.D., *President of the University*  
HERMON L. SLOBIN, PH.D., *Dean of the Graduate School*  
NORMAN ALEXANDER, PH.D., *Dean of Men*  
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OREN V. HENDERSON, *Registrar*  
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## THE GRADUATE COUNCIL

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GEORGE W. CASE, M.C.E., *Dean of the College of Technology*  
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C. FLOYD JACKSON, M.S., *Dean of the College of Liberal Arts*  
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THOMAS G. PHILLIPS, PH.D.  
GEORGE F. POTTER, PH.D.  
ALFRED E. RICHARDS, PH.D., *Secretary*  
A. MONROE STOWE, PH.D.

## THE GRADUATE FACULTY PROFESSORS

C. FLOYD JACKSON, M.S., *Zoölogy*  
WALTER C. O'KANE, A.M., D.SC., *Entomology*  
ALFRED E. RICHARDS, PH.D., *English*  
ORMOND R. BUTLER, PH.D., *Botany*  
HERMON L. SLOBIN, PH.D., *Mathematics*  
HARRY W. SMITH, A.M., *Economics*  
LEON W. HITCHCOCK, B.S., *Electrical Engineering*  
GEORGE F. POTTER, PH.D., *Horticulture*  
HELEN F. McLAUGHLIN, M.A., *Education*  
THOMAS G. PHILLIPS, PH.D., *Agricultural and Biological Chemistry*  
DONALD C. BABCOCK, S.T.B., A.M., *History*  
GEORGE W. CASE, M.C.E., *Mechanical Engineering*  
HERBERT F. RUDD, PH.D., *Philosophy and Psychology*  
HAROLD H. SCUDDER, B.S., *English*  
HAROLD A. IDDLES, PH.D., *Chemistry*  
EDMOND W. BOWLER, S.B. IN S.E., *Civil Engineering*  
A. MONROE STOWE, PH.D., *Education*  
CHARLES W. COULTER, PH.D., *Sociology*

## ASSOCIATE PROFESSORS

WILLIAM G. HENNESSY, A.M., *English*  
THORSTEN V. KALIJARVI, PH.D., *Political Science*  
ADOLPH G. EKDAHL, PH.D., *Psychology and Education*



## GRADUATE SCHOOL

ALMA D. JACKSON, M.A., *Zoölogy*  
JOHN S. WALSH, A.M., *Languages*  
HARLAN M. BISBEE, A.M., *Education*  
J. RAYMOND HEPLER, M.S., *Horticulture*  
WALTER E. WILBUR, M.S., *Mathematics*  
GEORGE W. WHITE, PH.D., *Geology*  
RUSSELL R. SKELTON, B.S. IN C.E., C.E., *Civil Engineering*

## ASSISTANT PROFESSORS

EDWARD T. DONOVAN, B.S., *Mechanical Engineering*  
ARTHUR W. JONES, M.A., *History*  
HEMAN C. FOGG, PH.D., *Chemistry*  
MARIAN F. MILLS, M.A., *Botany*  
STANLEY R. SHIMER, M.S., *Agricultural and Biological Chemistry*  
L. PHELPS LATIMER, PH.D., *Horticulture*  
EDYTHE T. RICHARDSON, M.S., *Zoölogy*  
ALLAN B. PARTRIDGE, M.A., *History*  
PHILIP M. MARSTON, M.A., *History*  
MARVIN R. SOLT, M.S., *Mathematics*  
WILLIAM B. NULSEN, M.S., *Electrical Engineering*  
NAOMI M. G. EKDAHL, PH.D., *Education*  
PAUL P. GRIGAUT, CERT. SORBONNE, DIPL. ECOLE DU LOUVRE, *Languages*  
JAMES A. FUNKHOUSER, PH.D., *Chemistry*  
CARROLL S. TOWLE, B.A., PH.D., *English*  
MARGARET R. HOBAN, B.S. IN ED., *Education*  
RICHARD H. KIMBALL, PH.D., *Chemistry*  
MULTIADES S. DEMOS, PH.D., *Mathematics*  
CHARLES M. MASON, PH.D., *Chemistry*  
CLAIR W. SWONGER, A.M., *Economics*  
WILLIAM YALE, PH.B., M.A., *History*  
THEODORE R. MEYERS, M.A., *Geology*

## INSTRUCTORS

STUART DUNN, PH.D., *Botany*  
JOHN A. FLOYD, A.B., *Languages*  
EARL H. LITTLE, B.S., *Agricultural Education*  
W. L. KICHLINE, M.S., *Mathematics*  
DONALD H. CHAPMAN, PH.D., *Geology*  
JAMES G. CONKLIN, M.S., *Entomology*  
LAWRENCE W. SLANETZ, PH.D., *Botany*  
RUTH E. THOMPSON, M.S., *Zoölogy*  
CLYDE W. MONROE, M.S., *Zoölogy*  
WILLIAM R. EADIE, M.S., *Zoölogy*  
ELEANOR L. SHEEHAN, M.S., *Zoölogy*  
DENVER E. BAUGHAN, PH.D., *English*  
ALBERT F. DAGGETT, PH.D., *Chemistry*

# THE GRADUATE SCHOOL

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## AIMS

The Graduate School aims to meet the needs of superior students who are preparing to become teachers in colleges or universities, or investigators, and to offer opportunities to qualified students for a more advanced training than they can obtain in an undergraduate curriculum.

## ADMINISTRATION

Graduate work is offered, under the supervision of the Dean of the Graduate School, by competent members of various departments of instruction and research. These members constitute the Faculty of the Graduate School.

The general administrative functions of the Faculty are delegated to the Dean and the Council.

## ADMISSION

A student who holds a bachelor's degree, or its equivalent, from an approved college or university, is eligible for admission to graduate study.

Admission to graduate study does not necessarily imply admission to candidacy for an advanced degree. Students who are not planning to become candidates for an advanced degree may be admitted to graduate study upon the recommendation of the heads of the departments concerned, and with the approval of the Dean.

A student may major only in the departments represented in the catalog of the Graduate School.

## TUITION AND FEES

Tuition is \$150 for residents of New Hampshire and \$250 for non-residents. Tuition is paid in advance in two equal installments, one on the first day of each semester.

## GRADUATE SCHOOL

A diploma fee of \$5 is charged upon graduation. Charges will be assessed for extraordinary breakage or damage. No laboratory or course fees are charged. Payment of the full tuition fee entitles the student to admission to all varsity athletic games and contests.

Members of the regular University staff and their immediate families electing work in the Graduate School shall be required to pay \$2.60 per semester credit for less than eight semester credits.

Members of the University staff who are employed on a fiscal year basis, who may register in the Summer School, shall be required to pay \$2.60 per semester credit with the further proviso that the general registration fee of \$10.00 for residents of New Hampshire shall not be charged.

Persons who are not members of the University staff or of their immediate families electing less than eight semester credits in the Graduate School will be expected to pay a registration fee of \$1.00 and a charge of \$5.25 for each semester credit.

Persons not residents of New Hampshire, and who are not candidates for a degree, registering in the Graduate School, shall be required to pay a registration fee of \$2.00 and tuition at the rate of \$10.50 per semester credit.

## HONORARY FELLOWSHIPS FOR VISITING SCHOLARS

Professors or other eminent scholars who may desire temporarily the privileges of the library and the research facilities of the University, and who are not candidates for a degree, may, upon recommendation of the Dean of the Graduate School and the approval of the President of the University, be appointed Honorary Fellows without stipend. Honorary Fellows shall not be required to pay any charges except, possibly, the cost of unusually expensive supplies or equipment.

## ASSISTANTSHIPS AND SCHOLARSHIPS

Graduate assistantships which usually require half-time service at a stated salary are available in a number of departments. Graduate assistants pay tuition in accordance with the regulation pertaining to the members of the University staff. The residence requirement for a Master's degree for holders of these appointments is not less than two years.

## UNIVERSITY OF NEW HAMPSHIRE

A limited number of superior students are awarded exemption from tuition. These awards are subject to the maintenance of a high scholarship record in the Graduate School and may be revoked by the Committee on Exemption of Tuition at the end of any term, if, in their judgment, the student does not merit such exemption for the subsequent terms.

Inquiries regarding these assistantships and scholarships should be addressed to the head of the department concerned.

### SUPPLIES

Books, drawing instruments, materials, etc., may be purchased at the University Bookstore in Thompson Hall.

### ROOMS

Because of the congestion of undergraduate students in the dormitories of the University, it is impossible to guarantee reservation of rooms to graduate students. Rooms may be secured in private houses at prices ranging from \$85 to \$150 per year.

Women students, unless living at home, are required to room in the women's dormitories, or in approved houses. A competent matron is in charge of each women's dormitory.

### BOARD

The University operates on a self-service basis a modern, well-appointed Commons. Both regular weekly board and cafeteria service are provided. Exact cost records are kept, and prices are adjusted in such a manner as to give students the advantage of changing costs.

### REGISTRATION

A student desiring to register for graduate study must submit to the Dean of the Graduate School the official application for admission to graduate study. Blanks for this purpose may be obtained from the Dean of the Graduate School.

Upon admission to graduate work, a student first pays his fee at the Business Office and deposits his enrollment cards with the Registrar.

## GRADUATE SCHOOL

### REQUIREMENTS FOR GRADUATE CREDIT

Graduate credit will not be allowed to undergraduate students unless such credit has been approved in advance by the Dean of the Graduate School.

A student will not receive graduate credit for a course in which he has obtained a grade lower than 70.

### ADVANCED DEGREES

The advanced degrees conferred are: Master of Science, Master of Arts, Master of Education, Master of Civil Engineering, Master of Electrical Engineering and Master of Mechanical Engineering.

#### REQUIREMENTS FOR THE MASTER'S DEGREE

**RESIDENCE.**—A minimum of one full academic year, or four summer sessions, in residence, is required.

**CREDITS.**—An average grade of at least 80 in not less than 30 semester credits is required, of which not less than 17 or more than 20 semester credits shall be devoted to the major course (including the thesis), and not less than 6 or more than 10 semester credits to the minor courses. Work in allied departments may be properly correlated with the major course. Of the total credits required for an advanced degree, not more than half will be accepted on admission from another institution.

**THESIS.**—If a thesis is required, the candidate must file with the Council, for their approval, a statement of the thesis subject as recommended by the head of the department in which the thesis work has been done, at least six months previous to the time the degree is sought.

All theses must be typewritten upon standard paper, eight and one-half by eleven inches, medium weight, neatly bound in black cloth, and gilt-lettered on the first cover with the title, name of author, degree sought, and year of graduation. The title page should bear the following statement:

"A thesis submitted to the University of New Hampshire in partial fulfillment of the requirements for the degree of

## UNIVERSITY OF NEW HAMPSHIRE

Master of Arts in (name of "major" subject)  
Master of Science in (name of "major" subject)  
Master of Education  
Master of Civil Engineering  
Master of Electrical Engineering  
Master of Mechanical Engineering."

Whenever a thesis is printed in any periodical, it must be designated as having been accepted as a Master's thesis by the University of New Hampshire.

Two bound copies must be filed before Commencement Day, one with the Librarian and one with the head of the department in which the major work has been done.

EXAMINATIONS.—All candidates must meet the regular departmental requirements as to examinations in the courses for which they are registered, and the requirement of a special comprehensive examination, by the heads of the departments in which the major and minor courses have been taken, three months previous to the time the degree is sought. In addition, the candidate must pass an oral examination by a special committee designated by the Council and including the heads of the departments in which the major and minor courses have been taken, before the candidate may be recommended for the Master's degree. At least two months previous to the time the degree is sought the candidate must file with the Dean of the Graduate School the "Application for Examination for Advanced Degree." The application forms may be obtained at the office of the Dean of the Graduate School.

## DESCRIPTION OF COURSES

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Courses numbered 51-100 are open to advanced undergraduates and graduate students. Courses numbered 101-200 are open to graduate students only.

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### *AGRICULTURAL AND BIOLOGICAL CHEMISTRY*

THOMAS G. PHILLIPS, *Professor*

STANLEY R. SHIMER, *Assistant Professor*

Students majoring in this department are expected to have had preparation in the biological sciences, in physics and in general, analytical and organic chemistry. Physical chemistry and a reading knowledge of German or French are desirable. The library and equipment of the Experiment Station are available for the use of graduate students.

#### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. **PHYSIOLOGICAL CHEMISTRY.** The chemistry of fats, carbohydrates and proteins, colloids, enzyme action, digestion, metabolism and excretion. The qualitative and quantitative examination of blood and urine. Assistant Professor Shimer.

Prerequisite: Satisfactory preparation in Organic Chemistry and Quantitative Analysis. 3 recitations; 2 laboratories; 5 semester credits. (Formerly 4-a, 5-b, 21-a)

53, 54. **AGRICULTURAL ANALYSIS.** A study of the methods of analysis of soils, fertilizers, feeding stuffs, and other products important in agriculture. Professor Phillips and Assistant Professor Shimer.

Prerequisite: Satisfactory preparation in Organic Chemistry and Quantitative Analysis. 1 recitation; 3 laboratories; 4 semester credits. (Formerly 7-a, 8-b, 9-c)

## UNIVERSITY OF NEW HAMPSHIRE

55. PLANT CHEMISTRY. A study of the chemistry of plant growth and of methods for the analysis of plant materials. Professor Phillips.

Prerequisite: Agricultural Chemistry 2. 2 recitations; 2 laboratories; 4 semester credits. (Formerly 6-b)

### COURSES PRIMARILY FOR GRADUATE STUDENTS

101, 102. ADVANCED BIOCHEMISTRY. The preparation, composition and analysis of carbohydrates, fats and proteins. Discussions and laboratory. Professor Phillips and Assistant Professor Shimer.

4 semester credits each. (Formerly 10-a, 11-b, 12-c)

103, 104. SPECIAL PROBLEMS. Conferences and library and laboratory work on special phases of chemistry in its relation to agriculture and biology. Professor Phillips and Assistant Professor Shimer.

Subject matter and credits to be arranged. (Formerly 13-a, 14-b, 15-c)

## BOTANY

### (BACTERIOLOGY)

ORMOND R. BUTLER, *Professor*

MARIAN E. MILLS, *Assistant Professor*

STUART DUNN, *Instructor*

LAWRENCE W. SLANETZ, *Instructor*

53, 54. ADVANCED BOTANY AND BACTERIOLOGY. The subject matter will depend upon the training and desire of the student. Cannot be elected without previous consultation. Professor Butler, Assistant Professor Mills, Mr. Dunn, and Mr. Slanetz.

Credits to be arranged. (Formerly 14-a, 15-b, 16-c)

101. MORPHOLOGY OF THE ALGAE. Study of the habits, structure, life histories and relationships of the various groups of the algae. Assistant Professor Mills.

Laboratory and assigned reading; 4 semester credits. Given in alternate years with 102. (Formerly 20-a)



## GRADUATE SCHOOL

102. MORPHOLOGY OF THE BRYOPHYTES AND PTERIDOPHYTIS. Study of the vegetative and reproductive organs, life histories and relationships of the liverworts, mosses, ferns and fern allies. Assistant Professor Mills.

Laboratory and assigned reading; 4 semester credits.  
(Formerly 21-a and -b)

103. MORPHOLOGY OF THE SPERMATOPHYTA. Study of the vegetative organs, vascular anatomy, the flower, fertilization, the embryo and phylogeny of the higher plants. Assistant Professor Mills.

Laboratory and assigned reading; 4 semester credits.  
(Formerly 22-c, 23-c)

104. SYSTEMATIC BOTANY. A study of the higher plants of our native flora. The student is required to prepare an herbarium of 90 plants. Assistant Professor Mills.

Prerequisite: Botany 1, 2. Conferences, field and laboratory work; 4 semester credits. (Formerly 25-c)

105. PLANT PHYSIOLOGY. Absorption, conduction, transpiration and excretion of water and effect of environmental factors upon these phenomena; mineral nutrition; carbon and nitrogen assimilation. Mr. Dunn.

Prerequisite: Botany 4. Laboratory and assigned reading; 5 semester credits. (Formerly 27-c, 28-b)

106. PLANT PHYSIOLOGY. Digestion of carbohydrates, fats and proteids, respiration and fermentation; effect of external conditions on growth, paratonic and autonomous movements. Mr. Dunn.

Prerequisite: Botany 4. Laboratory and assigned reading; 5 semester credits. (Formerly 29-c)

107. PLANT HISTOLOGY. General morphology of the tissue systems; the primary tegumentary tissue; the fundamental tissue system, the vascular tissue system, development of secondary members, formation of secondary tissue. Professor Butler.

Prerequisite: Botany 3. Laboratory and assigned reading; 5 semester credits. (Formerly 26-a)

108. DISEASES OF TREE AND BUSH FRUITS. The bacterial and fungous diseases of fruits, their symptoms, cause and prevention. Mr. Dunn.

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Prerequisite: Botany 5. Laboratory and assigned reading; 3 semester credits. Given in alternate years with 109. (Formerly 31-a, -b)

109. DISEASES OF FARM CROPS. The bacterial and fungous diseases of vegetables, their symptoms, cause and prevention. Mr. Dunn.

Prerequisite: Botany 5. Laboratory and assigned reading; 3 semester credits. Given in alternate years with 108. (Formerly 32-a, -b)

110. FUNGICIDES. Preparation and use of fungicides and a study of their effect upon the higher plants and parasitic organisms. Professor Butler.

Prerequisite: Botany 5. Laboratory and assigned reading; 4 semester credits. (Formerly 33-b)

## CHEMISTRY

HAROLD A. IDDLER, *Professor*

HEMAN C. FOGG, *Assistant Professor*

JAMES A. FUNKHOUSER, *Assistant Professor*

RICHARD H. KIMBALL, *Assistant Professor*

CHARLES M. MASON, *Assistant Professor*

ALBERT F. DAGGETT, *Instructor*

Graduate study in chemistry is open to those who have completed the chemistry curriculum of either the College of Liberal Arts or the College of Technology, or some similar course of study. Excellent opportunities are offered for research in General and Analytical Chemistry, Organic Chemistry and Physical Chemistry.

## COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

53, 54. ORGANIC CHEMISTRY. The lectures deal with the principal classes of organic compounds, aliphatic and aromatic, with emphasis upon class reactions and structural theory. In the laboratory, the preparation and purification of a selected number of organic compounds is carried on. The latter part of the laboratory work involves the use of group reactions for the identification of organic substances in a systematic scheme of qualitative organic analysis. Professor Iddles.

## GRADUATE SCHOOL

Prerequisite: Inorganic and Analytical Chemistry. 3 recitations; 2 laboratories; 5 semester credits. May be taken for graduate credit by majors in chemistry and others. (Formerly 40-a, 41-b, 42-c)

55, 56. THEORETICAL PROBLEMS OF MODERN ORGANIC CHEMISTRY. A consideration of the principles underlying the behavior of organic compounds, and the problems awaiting solution. The first semester includes such topics as free radicals, the nature of organic linkages, unsaturated compounds including conjugated systems, polymerization and tautomerism. The first portion of the second semester is devoted to a discussion of cyclic compounds and the benzene problem; the major portion to stereochemistry, including stereoisomerism, ring formation, and steric hindrance. Assistant Professor Kimball.

Prerequisite: Elementary Organic Chemistry. 3 recitations; 3 semester credits. (Formerly 152-a, 153-b, 154-c)

61, 62. SPECIAL TOPICS IN INORGANIC CHEMISTRY. The lectures of this course treat first of the structure and properties of matter as developed from studies of radio-activity, atomic structure, crystal structure, etc. With these as a foundation the course develops the relations between elements as they occur in the periodic arrangement. Werners' theory of complex compounds is considered at the close of the year. An effort is made to develop the historical background of all these topics as they are discussed. Assistant Professor Funkhouser.

Prerequisite: Inorganic and Analytical Chemistry. 2 recitations; 2 semester credits. (Formerly 100-a, 101-b)

83, 84. PHYSICAL CHEMISTRY. This course will take up the general principles of chemistry from the quantitative standpoint. It will include a study of the properties of gases, liquids and solids. The principles of thermodynamics will be presented and their application to chemistry discussed. These will be used as a basis for the study of solutions, ionic theory, chemical equilibria, thermo-chemistry, conductance, and electromotive force. The experiments in the laboratory will include accurate measurements illustrating the principles studied in the lectures. Problems will be assigned for solution by the student. Assistant Professor Mason.

Prerequisite: Chemistry 32, Mathematics 8, Physics 8. 3 recitations; 2 laboratories; 5 semester credits. (Formerly 160-c, 161-a, 162-b, 163-c)

# UNIVERSITY OF NEW HAMPSHIRE

## COURSES PRIMARILY FOR GRADUATE STUDENTS

101. ADVANCED QUANTITATIVE ANALYSIS — PHYSICO-CHEMICAL METHODS. The lectures discuss analytical procedures involving nephelometry, colorimetry, electrometric titrations, etc. The subjects of buffers, methods of determining pH, use and theory of electrodes for E.M.F. measurements, and electrolytic separations by controlled electrode potential and internal electrolysis are studied. Assigned readings are made in recent publications concerning these and other analytical topics. Assistant Professor Fogg.

Prerequisite: Elementary Quantitative Analysis. 2 recitations; 2 semester credits. (Formerly 206-a)

102. HISTORY OF CHEMISTRY. A course tracing the growth of chemistry, particularly theories of the science in an historical manner. The course also endeavors to give an insight into the personalities of famous chemists and lays some stress on the better known contemporary chemists and their work. Assistant Professor Funkhouser.

Prerequisite: Acceptable courses in Organic Chemistry. 2 recitations; 2 semester credits. (Formerly 202-c)

111. ORGANIC CHEMISTRY. The chemistry of the polynuclear compounds and heterocyclic systems. Professor Iddles.

3 recitations; 3 semester credits. (Formerly 252-a)

115. ORGANIC CHEMISTRY LABORATORY—QUALITATIVE ANALYSIS. The reactions and properties of organic compounds. Use of group reactions in the identification of organic substances. Professor Iddles.

1 recitation; 2 laboratories; 3 semester credits. (Formerly 250-b)

116. ORGANIC CHEMISTRY LABORATORY—QUANTITATIVE ANALYSIS. The combustion for carbon and hydrogen, Dumas nitrogen, Kjeldahl nitrogen, estimation of halogens, of sulphur and of organic radicals. The work will include some micro-determinations. Professor Iddles.

1 recitation; 2 laboratories; 3 semester credits. (Formerly 251-c)

121. PHYSICAL CHEMISTRY—CHEMICAL THERMODYNAMICS. The application of thermodynamics to chemistry. The principles of therm-

## GRADUATE SCHOOL

odynamics will be thoroughly reviewed. These principles will be applied in detail to the phase rule, chemical equilibrium, electromotive force, theory of solutions, specific heats and similar topics. Assistant Professor Mason.

Prerequisite: One year of Physical Chemistry. 3 recitations; 3 semester credits. (Formerly 260-a, 261-b)

122. PHYSICAL CHEMISTRY—CHEMICAL KINETICS. A study of the kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems, including an introduction to photochemistry. Mr. Daggett.

Prerequisite: One year of Physical Chemistry. 3 recitations; 3 semester credits. (Formerly 262-c)

131, 132. COLLOQUIUM IN ORGANIC CHEMISTRY. The lectures will consider a special field of organic chemistry and will be varied from semester to semester. Professor Iddles, Assistant Professors Funkhouser and Kimball.

1 class meeting; 2 semester credits. (Formerly 253-b, 254-c)

133, 134. COLLOQUIUM IN PHYSICAL CHEMISTRY. The lectures will consider a special field of physical chemistry and will be varied from semester to semester. Assistant Professor Mason and Mr. Daggett.

1 class meeting; 2 semester credits. (Formerly 201-b)

136. COLLOQUIUM ANALYTICAL CHEMISTRY AND RARE EARTHS. The lectures will consider recent topics in analytical chemistry and developments in the field of rare earths. Assistant Professor Fogg.

1 class meeting; 2 semester credits. (Formerly 200-a)

141, 142. SEMINAR. Presentation and discussion of recent investigations in the field of chemistry.

No credit. (Formerly 270-a, 271-b, 272-c)

151, 152. RESEARCH FOR THE MASTER'S DEGREE.

Credit arranged. (Formerly 280-a, 281-b, 282-c)

# UNIVERSITY OF NEW HAMPSHIRE

## EDUCATION

A. MONROE STOWE, *Professor*

HARLAN M. BISBEE, *Associate Professor*

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HELEN F. McLAUGHLIN, *Professor (Home Economics-Education)*

WALTER E. WILBUR, *Associate Professor (Mathematics-Education)*

MARGARET R. HOBAN, *Assistant Professor (Physical Education)*

JOHN A. FLOYD, *Instructor (Language-Education)*

DENVER E. BAUGHAN, *Instructor (English-Education)*

The graduate work of students in Education is designed to supplement their undergraduate studies in such ways as to prepare them most effectively for the profession of secondary school teaching or secondary school administration.

For admission to candidacy for a Master's degree in Education, a student must present, in addition to a bachelor's degree, evidence of having satisfactorily completed (a) the course in Psychological Principles of Secondary Education or its equivalent, (b) eighteen semester credits in a teaching major subject, (c) twelve semester credits in a first teaching minor subject and (d) six semester credits in a second teaching minor subject.

Candidates for the Master's degree in Education must submit evidence of having satisfactorily completed the following courses in Education or their equivalents either as undergraduate or graduate students:

Education 51, 52    Social Principles of Secondary Education, 6 semester credits.

Education 61       Principles and Problems of Teaching in the Secondary Schools, 3 semester credits.

Either

Education 71, 72    History of Civilization and Education, 6 semester credits.

or

Education 75       Democracy in Education and Character Development, 3 semester credits.

and

Education 76       Philosophy of Education, 3 semester credits.

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- Education 91      A Course in Problems in the Teaching of  
the Major Subject, 3 semester credits.
- Education 91      A Course in Problems in the Teaching of  
a Minor Subject, 3 semester credits.

The candidate must also present either evidence of having taught successfully for three or more years or, in lieu of such successful teaching, evidence of having satisfactorily completed one semester of supervised teaching, Education 94. Graduate students successfully completing Education 94 with a grade of at least 75 will receive nine semester credits toward the Master's degree. In the case of such students it will ordinarily require at least an academic year and a summer school session in which to meet the requirements of the Master's degree in Education.

51, 52. SOCIAL PRINCIPLES OF SECONDARY EDUCATION. This course in educational sociology and secondary education is devoted to a consideration of the educationally significant aspects and needs of our modern democratic society and to a study of the organization, functions, curricula and outstanding problems of our American institutions of secondary education. Professor Stowe.

Open to students who have satisfactorily completed 41, 42.  
Required of students completing the University Teacher  
Training Curriculum. 3 recitations; 3 semester credits.  
(Not open to students who have credit for 21-a, 38-a,  
and 39-b, or 131-a, 132-b, 133-c)

61, (61). PRINCIPLES AND PROBLEMS OF TEACHING IN THE SECONDARY SCHOOL. This course is devoted to a study of the following aspects of teaching in secondary schools:

- (1) Secondary school objectives and the objectives in the teaching of secondary school subjects.
- (2) Principles of teaching and of directing learning incorporated in teaching which meets the needs of high school students and attains the objectives of the secondary school.
- (3) Secondary school tests and the ways in which teachers are endeavoring to ascertain the extent to which their objectives are being attained.

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- (4) Class management, the purpose of which is to insure conditions favorable to the attainment of the objectives of the secondary school. Associate Professor Bisbee.

Open to students who have satisfactorily completed 121-a, 122-b, 123-c, or 41, 42. Required of students completing the University Teacher Training Curriculum. 3 recitations; 3 semester credits. (Not open to students who have credit for 23-c, 40-c, and 141, 142)

### 71, 72. HISTORY OF CIVILIZATION AND EDUCATION.

(Not offered in 1936-37)

75. DEMOCRACY IN EDUCATION AND CHARACTER DEVELOPMENT. This course will discuss student participation in high school control; social functions; the underlying principles of club work; the problem of character education and a discussion of the moral standards in our high schools as revealed by investigations. Assistant Professor Bisbee.

Open to Seniors who have satisfactorily completed 121-a, 122-b, 123-c, or 41, 42. 3 recitations; 3 semester credits. (Not open to students who have credit for 52-a or 149-a)

76. PHILOSOPHY OF EDUCATION. A consideration of the fundamental concepts and ultimate objectives of education, current educational doctrines and controversies, changes in educational procedures, historic background and philosophical implications. Associate Professor Bisbee.

Open to students who have satisfactorily completed 121-a, 122-b, 123-c, 131-a, 132-b, 133-c, or 41, 42 and 51-52. 3 recitations; 3 semester credits. (Not open to students who have credit for 47-c, or 147-c.)

### \*101. PRINCIPLES AND PROBLEMS OF PUBLIC SCHOOL ADMINISTRATION.

3 semester credits. Not open to students who have credit for Education 151, 152.

### \*111. PRINCIPLES AND PROBLEMS OF HIGH SCHOOL ADMINISTRATION.

3 semester credits. Not open to students who have credit for Education 153, 154.

\* Not offered in 1936-37 but offered in the 1936 Summer School.



## GRADUATE SCHOOL

### \*\*121. PRINCIPLES AND PROBLEMS OF HIGH SCHOOL SUPERVISION.

3 semester credits. Not open to students who have credit for Education 155, 156.

\*\*131, 132. SEMINAR IN EDUCATIONAL PROBLEMS. The problems to be studied will depend upon the interests of the students enrolled in the seminar. Professor Stowe.

Open to Seniors and graduate students majoring in Education. Credits to be arranged. (A substitute for Education 55-a, 56-b, 57-c and Education 157-a, 158-b and 159-c)

### \*COURSES IN THE TEACHING OF HIGH SCHOOL SUBJECTS

The following three-semester-credit courses are devoted to a study of problems of objectives, selection and organization of subject-matter, teaching and testing techniques and classroom management in the teaching of the respective subjects.\* Students desiring to do supervised teaching must complete with a grade of at least 75 one of these courses in the subject in which he hopes to do supervised teaching.

\*\*CHEMISTRY-EDUCATION (CH-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL CHEMISTRY.

ENGLISH-EDUCATION (ENG-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL ENGLISH. Mr. Baughan.

FRENCH-EDUCATION (FR-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL FRENCH. Mr. Floyd.

HISTORY-EDUCATION (HIST-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL HISTORY. Professor Stowe.

LATIN-EDUCATION (LA-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL LATIN.

MATHEMATICS-EDUCATION (MATH-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL MATHEMATICS. Associate Professor Wilbur.

PHYSICAL EDUCATION (P-E) 91. PROBLEMS IN THE TEACHING OF PHYSICAL EDUCATION. Assistant Professor Hoban.

\*\*PHYSICS-EDUCATION (PH-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL PHYSICS.

\* For details concerning prerequisites and nature of these courses, see description given under respective subject-matter departments.

\*\* Not offered in 1936-37 but offered in the 1936 Summer School.

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## SUPERVISED TEACHING

In this work the student participates in the conduct of class exercises and in the control of the classroom, at first chiefly as an observer, but gradually entering into teacher responsibilities until complete charge of the classroom is secured.

This work is required in the University Teacher Training Curriculum. It is open only to students whose applications are approved by the Professor of Education acting as Director of Student Teaching and the supervisor of student teaching in the subject or subjects in which the applicant desires to do supervised teaching. Applications should be filed in the office of the Professor of Education in October of the academic year in which the supervised teaching is to be done. No applications will be considered unless the applicant has completed with a grade of at least 75 the following courses in Education: 41, 42, or 121-a, 122-b, and 123-c, 51-52, 121-a, 132-b, 133-c, and 61, or 141-a, 142-b, and, with an average grade of 75 or better, at least 18 semester credits in the subject-matter field in which he desires to teach under supervision. The applicant must also complete with a grade of at least 75 a course in the problems of teaching the subject in which he desires to do supervised teaching.

EDUCATION-BIOLOGY (BI-ED) 94. SUPERVISED TEACHING IN HIGH SCHOOL BIOLOGY.

EDUCATION-CHEMISTRY (ED-CHEM) 94. SUPERVISED TEACHING IN HIGH SCHOOL CHEMISTRY.

EDUCATION-CIVICS (ED-CIV) 94. SUPERVISED TEACHING IN HIGH SCHOOL CIVICS.

EDUCATION-COMMERCIAL SUBJECTS (ED-CS) 94. SUPERVISED TEACHING IN HIGH SCHOOL COMMERCIAL SUBJECTS.

EDUCATION-ECONOMICS (ED-ECON) 94. SUPERVISED TEACHING IN HIGH SCHOOL ECONOMICS.

EDUCATION-ENGLISH (ED-ENG) 94. SUPERVISED TEACHING IN HIGH SCHOOL ENGLISH.

EDUCATION-FRENCH (ED-FR) 94. SUPERVISED TEACHING IN HIGH SCHOOL FRENCH.

EDUCATION-HISTORY (ED-HIST) 94. SUPERVISED TEACHING IN HIGH SCHOOL HISTORY.

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EDUCATION-LATIN (ED-LAT) 94. SUPERVISED TEACHING IN HIGH SCHOOL LATIN.

EDUCATION-MATHEMATICS (ED-MATH) 94. SUPERVISED TEACHING IN HIGH SCHOOL MATHEMATICS.

EDUCATION-PHYSICAL EDUCATION (ED-PE) 94. SUPERVISED TEACHING IN HIGH SCHOOL PHYSICAL EDUCATION.

EDUCATION-PHYSICS (ED-PH) 94. SUPERVISED TEACHING IN HIGH SCHOOL PHYSICS.

EDUCATION-SOCIOLOGY (ED-SOC) 94. SUPERVISED TEACHING IN HIGH SCHOOL SOCIOLOGY.

## ENGINEERING

GEORGE W. CASE, *Professor*

LEON W. HITCHCOCK, *Professor*

EDMOND W. BOWLER, *Professor*

RUSSELL R. SKELTON, *Associate Professor*

EDWARD T. DONOVAN, *Assistant Professor*

WILLIAM B. NULSEN, *Assistant Professor*

Graduate work is offered in civil, electrical and mechanical engineering leading to the degrees of Master of Civil Engineering, Master of Electrical Engineering and Master of Mechanical Engineering, respectively. A thesis of professional character and ten semester credits of course work, a major part of which has a bearing on the thesis subject, constitutes the requirement for the degree.

The following courses, which require as prerequisites the completion of undergraduate work in these fields, are available to candidates and may have their content changed to meet the requirements of the theses which they are designed to serve.

Civil Engineering 51, 52—Hydraulic Engineering

Civil Engineering 61, 62—Highway Engineering

Electrical Engineering 51, 52—Distribution and Industrial Problems

Electrical Engineering 61, 62—Electrical Circuit Theory

Mechanical Engineering 51, 52—Thermodynamics

Mechanical Engineering 61, 62—Engineering Economy

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ENGLISH

ALFRED E. RICHARDS, *Professor*

HAROLD H. SCUDDER, *Professor*

WILLIAM G. HENNESSY, *Associate Professor*

CARROLL S. TOWLE, *Assistant Professor*

The candidate for an advanced degree who elects English as his major subject must have a reading knowledge of French and German, or of Latin or German.

COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE  
STUDENTS

52. INTRODUCTION TO DRAMA. This course is a comprehensive survey of dramatic literature from the Greek drama to the present. Associate Professor Hennessy.

3 recitations; 3 semester credits. (Not given in 1936-37)  
(Formerly 71-c)

53, 54. SHAKESPEARE'S PLAYS. This course comprises a study of the major histories, comedies, and tragedies. Shakespeare is interpreted as poet and dramatist. Associate Professor Hennessy.

3 recitations; 3 semester credits. (Formerly 67-a, 68-b,  
69-c)

55. MILTON. A detailed study of Milton's minor poetry and the *Paradise Lost*. Consideration is also given to the social, political and religious history of Milton's day. Professor Scudder.

3 recitations; 3 semester credits. (Not given in 1936-37)  
(Formerly 61-a, 62-b)

57. THE ENGLISH NOVEL IN THE EIGHTEENTH CENTURY. The novel from Defoe through the Gothic Romance. There will be lectures and constant reading. Assistant Professor Schoedinger.

3 recitations; 3 semester credits. (Not given in 1936-37)  
(Formerly 59-a, 60-b)

59. THE ENGLISH NOVEL OF THE NINETEENTH CENTURY. A study of the novel from Jane Austen to Thomas Hardy. Professor Scudder.

3 recitations; 3 semester credits. (Formerly 63-a, 64-b)

## GRADUATE SCHOOL

61, 62. THE ENGLISH ROMANTIC WRITERS. A course dealing with the major writers of the early nineteenth century, such as Wordsworth, Coleridge, Byron, Lamb, Shelley, Hazlitt, and Keats. One hour of the week will be devoted to round-table discussion with small groups. Assistant Professor Towle.

3 recitations; 3 semester credits. (Formerly 159-a, 160-b, 161-c)

63, 64. ADVANCED AMERICAN LITERATURE. A series of studies in special fields, the subjects to be announced. In 1936-37 the subjects are: the American Poetry of the Nineteenth Century, and the New England Renaissance. In 1937-38 the subjects are: the American Novel, and the American Short Story. Professor Scudder.

3 recitations; 3 semester credits. (Formerly 54-a, 55-b, 56-c)

65, 66. WRITING AS AN ART. A course in the study and practice of writing through an examination of the history of literary criticism. The reading of famous critical essays and of many contemporary opinions, correlated with practice writing of various types. Each student is allowed to spend much of his time with the type he finds most congenial. Collateral reading, with frequent class discussions and conferences. Assistant Professor Towle.

Prerequisite: an advanced course in English composition.  
3 recitations; 3 semester credits. (Not given in 1936-37)  
(Formerly 154-a, 155-b, 156-c)

67, 68. CHAUCER. A study of Chaucer's life and times, a reading of his principal works. In the first semester, lectures upon Old and Middle English grammar are given, and a few of the minor poems are read. In the second semester, *Troilus* and *Cressida* and most of the *Canterbury Tales* are read. Professor Richards.

3 recitations; 3 semester credits. (Formerly 77-b, 78-c)

## COURSES PRIMARILY FOR GRADUATE STUDENTS

101, 102. COLLATERAL READING. A study, in translation, of selections from the great writers of literature. In the first semester special attention is given to Dante's *Divine Comedy*; in the second, to Cer-

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vantes' *Don Quixote* and to Goethe's *Faust*. Lectures, recitations, and written reports. Professor Richards.

3 recitations ; 4 semester credits. (Formerly 301-a, 302-b, 303-c)

103, 104. THE FAUST STORY. A study of the Faust legend as it is found in the literature of Germany and of England. Special attention is given to Marlowe's drama and to the later forms of the legend in English literature. Professor Richards.

3 recitations ; 4 semester credits. (Formerly 304-a, -b, -c)

### ENTOMOLOGY

WALTER C. O'KANE, *Professor*  
JAMES G. CONKLIN, *Instructor*

The aim of graduate study in this department is to prepare a student for professional work in one or more of the several specialized divisions of economic entomology. Such preparation requires more time and effort than represented by the four years of undergraduate college work. It assumes that in his undergraduate studies the student has laid a groundwork of general entomology and appropriate related sciences.

The student who wishes to enter graduate work will be expected to present such a foundation, its details depending on the phase of professional entomology in which the student desires to specialize. Related sciences presented may include courses in zoölogy, chemistry, botany, plant pathology, bacteriology, horticulture, or physics, in various combinations. Consultation with the head of the Department of Entomology will determine the prerequisites necessary in a given case.

### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

Under suitable circumstances graduate credit may be obtained for the following courses, which are open to undergraduates, provided the permission of the head of the Department of Entomology is secured, and provided that the graduate student completes additional work in these courses and attains superior grades.

## GRADUATE SCHOOL

52. INSECTS OF ORCHARD AND GARDEN. The application of methods of insect control to typical injurious species. Studies of the life histories and habits of important insect pests of orchard, garden and certain field crops. Professor O'Kane.

Prerequisite: Entomology 1. 2 recitations; 1 laboratory; 2 semester credits. (Given in alternate years; offered in 1937-38) (Formerly 2-a)

53. INSECTS OF DOMESTIC ANIMALS. The insect enemies of domestic livestock; their life histories, habits and means of control. Professor O'Kane.

Prerequisite: Entomology 1. 2 recitations; 1 laboratory; 2 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 3-b)

54. HOUSEHOLD INSECTS. MEDICAL ENTOMOLOGY. The life histories, habits and means of control of insects of the household and of stored products. The relation of insects to disease. Professor O'Kane.

2 recitations; 1 laboratory; 2 semester credits. (Formerly 4-c)

56. FOREST INSECTS. Studies of the life histories and habits of the more destructive forest insects and means of their control. Professor O'Kane.

2 recitations; 1 laboratory; 2 semester credits. (Formerly 13-c)

57. ADVANCED ENTOMOLOGY. Studies of the external morphology of insects, with special reference to the structures used in classification. Professor O'Kane and Mr. Conklin.

Required of students specializing in Entomology. 2 recitations; 2 laboratories; 4 semester credits. (Formerly 5-a, 6-b, 7-c)

58. ADVANCED ENTOMOLOGY. Studies of the internal anatomy and physiology of insects. Professor O'Kane and Mr. Conklin.

Prerequisite: Entomology 57. Required of students specializing in Entomology. 2 recitations; 2 laboratories. 4 semester credits. (Formerly 5-a, 6-b, 7-c)

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59, 60. ADVANCED ECONOMIC ENTOMOLOGY. Detailed studies of problems involved in applied entomology. The literature of economic entomology. Investigational methods. Practice in arranging projects. Studies of the specialized phases of entomology. Professor O'Kane and Mr. Conklin.

Open to students only by permission of head of department. Required of students specializing in Entomology. Hours and credits to be arranged. (Formerly 8-a, 9-b, 10-c)

61, 62. SYSTEMATIC ENTOMOLOGY. The orders and families of insects. Taxonomic studies. Mr. Conklin.

Hours and credits to be arranged.

### COURSES PRIMARILY FOR GRADUATE STUDENTS

The following courses represent a sequence of studies arranged to include such branches as insect anatomy, insect physiology, details of taxonomy, insect behavior, insect ecology, problems of dispersion, the organization of research, the organization of regulatory measures, and other phases involved in professional entomology. The sequence includes, also, the planning and prosecution of a problem in research, with presentation of the results in the form of a thesis.

101, 102. GRADUATE ENTOMOLOGY. Professor O'Kane and Mr. Conklin.

Prerequisites: Entomology 57 to 60, or the equivalent. Hours and credits to be arranged. (Formerly 14-a, 15-b, 16-c)

103, 104. GRADUATE ENTOMOLOGY. Professor O'Kane and Mr. Conklin.

Prerequisites: Entomology 57 to 60, or the equivalent. Hours and credits to be arranged. (Formerly 17-a, 18-b, 19-c)



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### GEOLOGY

GEORGE W. WHITE, *Associate Professor*

THEODORE RALPH MEYERS, *Assistant Professor*

DONALD H. CHAPMAN, *Instructor*

Students majoring in this department are expected to have had preparation in physical geology, historical geology, structural geology, mineralogy and chemistry. Students expecting to work mainly in physical geology should have had additional training in chemistry and physics; those expecting to work mainly in historical geology should have had additional training in zoölogy.

Southern New Hampshire presents many attractive geologic problems, especially in the fields of physiography, glacial geology, and metamorphic and igneous geology.

#### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. MINERALOGY. A study of crystals followed by a study of minerals and mineral determination by means of physical characteristics. Associate Professor White.

2 recitations; 1 laboratory; 3 semester credits. Does not carry graduate credit for undergraduates majoring in Geology. (Formerly 51-a, 52-b, 53-c)

53, 54. ECONOMIC GEOLOGY. A study of metal ores, coal, and petroleum; and the structures and geologic setting in which each occurs. Assistant Professor Meyers.

3 recitations; 3 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 75-a, 76-b, 77-c)

55, 56. PALEONTOLOGY. A study of animal fossils, both invertebrate and vertebrate, and of plant fossils. Chief emphasis is given to invertebrate forms.

2 recitations; 1 laboratory; 3 semester credits. (Given in alternate years; not offered in 1936-37) (Formerly 78-a, 79-b, 80-c)

57, 58. GEOLOGIC PROBLEMS. A study of special problems by means

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of conferences, reading, and field work. Associate Professor White, Assistant Professor Meyers and Mr. Chapman.

Hours and credits to be arranged. (Formerly 81-a, 82-b, 83-c)

### COURSES PRIMARILY FOR GRADUATE STUDENTS

101, 102. GLACIAL GEOLOGY. A detailed study of glacial geology, principally of North America, with special emphasis on New England. Associate Professor White and Mr. Chapman.

Prerequisites: Courses in physical geology and physiography. 2 recitations; 2 laboratories or equivalent time in field work; 4 semester credits.

103, 104. OPTICAL CRYSTALLOGRAPHY AND PETROGRAPHY. A study of minerals and rocks in powder and in thin sections by means of the petrographic microscope. Assistant Professor Meyers.

Prerequisites: Courses in mineralogy and physics. 1 recitation; 2 laboratories; 3 semester credits.

105, 106. RESEARCH. Work on special problems.

Geomorphology—Associate Professor White.

Glacial Geology—Associate Professor White and Mr. Chapman.

Areal Geology and Petrography—Assistant Professor Meyers.

Prerequisites: Special permission. Credits to be arranged.

## HISTORY

DONALD C. BABCOCK, *Professor*

ARTHUR W. JONES, *Assistant Professor*

ALLAN B. PARTRIDGE, *Assistant Professor*

PHILIP M. MARSTON, *Assistant Professor*

WILLIAM YALE, *Assistant Professor*

### ADMISSION TO GRADUATE STUDY

1. The completion of 20 semester credits, or the equivalent thereof, in history, exclusive of History 1, 2, and with an average grade of 75 or better.

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2. The understanding that the earning of graduate credit implies
  - (a) A "passing grade" of 85 in courses taken in the same class with undergraduates.
  - (b) A "passing grade" of 80 in other courses.
  - (c) An additional 20% of work to be done as an extra assignment in classes with undergraduates.
  - (d) A willingness and a desire to do more than the required minimum, especially as regards collateral reading.

### ADMISSION TO CANDIDACY

1. Reading knowledge of a foreign language.
2. A comprehensive examination in the field of general history.
3. Favorable judgment of the head of the department as well as of the Dean of the Graduate School.

OBJECTIVES. In general, two classes of graduate students may find it profitable to do their major work in this department. The first consists of students who desire a more extended knowledge and a more complete historical background to round out a liberal education, and perhaps to prepare them for the teaching of history. The second consists of those who wish to specialize on some phase of New England history, preferably that of New Hampshire.

PLAN OF WORK; GENERAL COURSE. Graduate students in this department will, at the discretion of the head of the department, include in their programs, after admission to candidacy, course 101, History Survey. At some later period they will include 102, History Reading and Theory. Those not specializing in New England history will complete their major work from courses listed in the general catalog. As a rule, no thesis will be written.

SPECIAL COURSE. Students specializing in the history of New England will be expected to choose as a subject for the thesis some topic within this field. For this purpose the available facilities for research are considerable, including the libraries of this and other universities, the State Library and the Library of the Historical Society in Concord, and various town records, private documents, unrecorded personal memoirs, landmarks, etc. A part of the work of this department is conceived to be the discovery and conservation of source

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material existing in the material and mental accumulations of the older type of New England population.

Courses 104-108 inclusive are designed for students of New England history. These courses are not given in class work, and only students especially well prepared will be permitted to follow this line of work.

### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. RECENT WORLD HISTORY. A historical introduction to the post-war period with a study of its most outstanding historical developments based on study of the World War, its causes, its progress, and its settlement, showing how these are connected with historic developments since 1919. Assistant Professor Yale.

Elective for Juniors and Seniors. 3 lectures or recitations; 3 semester credits. Also a special section elective by permission of the instructor: 4 lectures or recitations; 4 semester credits. (Formerly 78-a, 79-b, 80-c)

53, 54. THE HISTORY OF CIVILIZATION. This course is designed to show the close connections between the historical development of western society in both Europe and North America and their educational institutions. It traces the early development of educational institutions in the Ancient Orient, Greece and Rome through the Dark and Middle Ages down to modern times. It connects the development of modern educational systems in Europe and the United States with nineteenth and twentieth century developments. Assistant Professor Yale.

Elective for Seniors. 3 lectures or recitations; 3 semester credits.

55, 56. THE INTERPRETATION OF HISTORY. An investigation of some of the ways in which thoughtful persons have viewed the historic process as a whole. The aim is the interpretation of life; the method is to combine philosophy, sociology, and history, with emphasis on the latter. Professor Babcock.

Required of students majoring in History. 3 lectures or discussions; 3 semester credits. (Formerly 87-a, 88-b, 89-c)

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57, 58. HISTORIOGRAPHY. A study of the lives and writings of some of the leading historians from earliest times to the present, with the motive of learning what their contributions were to the scope, method, viewpoint, and literary achievement in the historical field. Assistant Professor Partridge.

Required of students majoring in History. 3 lectures or recitations; 3 semester credits. (Not offered in 1936-37)  
(Formerly 90-a, 91-b, 92-c)

HISTORY-EDUCATION (HIST-ED) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL HISTORY. This course includes a study of the purposes and objectives of teaching high school history, of the selection and organization of teaching material, and of teaching and testing techniques which may be advantageously used in teaching high school history. The course will include experiments in studying and teaching recent American history. Professor Stowe.

Open to students who have satisfactorily completed History 7, 8, Political Science 1, 2, Economics 1, 2 or 3, 4, and Education 61. 3 class meetings; 3 semester credits.  
(Formerly Hist-Ed 161-a)

### COURSES RESTRICTED TO GRADUATE STUDENTS

- 101. Historic Survey. (Formerly 1-g)
- 102. Historic Reading and Theory. (Formerly 2-g, 3-g)
- 104, 105. New England History. (Formerly 4-g, 5-g, 6-g)
- 107, 108. New Hampshire History. (Formerly 7-g, 8-g, 9-g)
- 110, 111. Thesis. (Formerly 10-g, 11-g, 12-g)

## HORTICULTURE

GEORGE F. POTTER, *Professor*

J. RAYMOND HEPLER, *Associate Professor*

L. PHELPS LATIMER, *Assistant Professor*

Graduate work in horticulture is offered to students who desire training for professional work, and who have fulfilled the requirements for undergraduate students majoring in horticulture at this or a similar institution. A reading knowledge of French and German is desirable. The student should also have had sufficient practical

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experience to enable him to understand and appreciate the problems of horticulture.

Students will find the department well equipped for fundamental research on horticultural problems.

### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

41, 42. **ADVANCED HORTICULTURE.** Subject-matter to meet the needs of special students or groups of students may be taken by arrangement with the head of the department.

Hours and credits to be arranged. (Formerly 14-a, 15-b, 16-c)

54. **ADVANCED POMOLOGY.** A detailed study of fundamental principles and experimental data and their application and relation to orchard problems such as growth and rest period in fruit plants, water requirements, soil management, pruning, fruit bud formation, fruit setting, pollination, thinning, winter injury and the quality and keeping period of fruits in storage.

2 recitations; 2 semester credits. (Formerly 6-b)

55. **SYSTEMATIC SURVEY OF FRUITS.** A study of the more important species of fruits and their botanical relationships.

2 recitations; 2 semester credits. (Formerly 5-a)

65. **COMMERCIAL VEGETABLE GARDENING.** This course deals with the management of commercial vegetable gardens. Special attention is given to the botanical relationships of the principal species of plants cultivated as vegetables.

2 recitations; 1 laboratory; 3 semester credits.

91, 92. **HORTICULTURAL SEMINAR.** A review of the recent horticultural literature and methods of investigational work.

2 recitations; 2 semester credits. (Formerly 12-a, 12.5-b)

94. **EVOLUTION AND IMPROVEMENT OF PLANTS.** The application of the principles of genetics to agricultural plant breeding. Hybridization

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and selection are studied as means of improving horticultural varieties of plants.

Prerequisite: Zoölogy 49. 2 recitations; 2 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 10-b)

### COURSES PRIMARILY FOR GRADUATE STUDENTS

101. PROBLEMS IN FLOWER BUD FORMATION. A discussion of scientific and experimental evidence bearing on flower formation, growth, and composition of fruit plants, alternate bearing of apples, and soil management and fertilization of orchards.

2 recitations; 3 semester credits. (Formerly 101-b)

102. METHODS OF HORTICULTURAL RESEARCH. An examination of methods used in laboratory and field by horticultural investigators.

2 recitations; 2 semester credits. (Formerly 102-b)

103. PROBLEMS IN WINTER INJURY. The physiology of winter injury to fruit plants.

2 recitations; 3 semester credits. (Formerly 103-a)

105. PHYSIOLOGICAL PROBLEMS IN PROPAGATION AND GROWTH. The problems of water relations, rest period, propagation, pruning and thinning of orchard fruits.

2 recitations; 3 semester credits. (Formerly 104-b)

106. PROBLEMS IN POLLINATION AND FRUIT STORAGE. The experimental evidence dealing with pollination, fruit setting, color development, and storage of fruits.

2 recitations; 2 semester credits. (Formerly 105-c)

108. PROBLEMS IN VEGETABLE PRODUCTION. A critical study of the physiological problems involved in vegetable production.

2 recitations; 3 semester credits. (Formerly 106-a)

125, 126. RESEARCH IN HORTICULTURE.

Credits to be arranged. (Formerly 125-a)

# UNIVERSITY OF NEW HAMPSHIRE

## LANGUAGES

CLIFFORD S. PARKER, *Professor*

JOHN STEPHEN WALSH, *Associate Professor*

RUDOLF L. HERING, *Assistant Professor*

PAUL P. GRIGAUT, *Assistant Professor*

JOHN A. FLOYD, *Instructor*

To pursue graduate work in French, an applicant, if a graduate of the University of New Hampshire, must have passed 18 semester credits of undergraduate work in French, and must have demonstrated his fitness for work in the graduate courses offered by this department. If a graduate of another institution, an applicant must show by his record and by his knowledge of French that he is prepared to undertake the work.

### FRENCH

#### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

53, 54. FRENCH ROMANTICISM. This course, covering the period from the year 1750 to 1850, will begin with a study of J. J. Rousseau's work and influence, continue with the important writers of the Romantic school in the 19th century, and analyze the intermingling of Romanticism and Realism in the work of Balzac. Professor Parker.

Prerequisite: French 12. 3 recitations; 3 semester credits. (Formerly 16-a, 17-b, 18-c)

57, 58. FRENCH LITERATURE FROM 1850 TO THE PRESENT. This course will study Realism and Naturalism in the novel and drama, the Parnassian and Symbolist schools in poetry, the psychological novels of Bourget, and the various schools and trends of the late 19th and early 20th centuries. Conducted largely in French. Assistant Professor Grigaut.

Prerequisite: French 52, 54, or 64. 3 recitations; 3 semester credits. (Formerly 19-a, 20-b, 21-c)

61, 62. FRENCH GRAMMAR. This course, intended primarily for those who intend to teach French, will be devoted to a systematic study of French grammar in all its phases from elementary to highly advanced. Assistant Professor Grigaut.



## GRADUATE SCHOOL

Prerequisite: Permission of the instructor or of the head of the department. Permission will be granted only to Juniors, Seniors, and graduate students. 3 recitations; 3 semester credits. (Formerly 22-a, 23-b, 24-c)

64. FRENCH LITERATURE AND CIVILIZATION OF THE MIDDLE AGES AND THE RENAISSANCE. A study of the various forms and masterpieces of French literature from the beginning to the year 1600, with consideration of their historical and social background. Lectures, extensive reading, reports, and recitations. Recommended for Seniors and graduate students. Professor Parker.

Prerequisite: French 52 or 54. 3 recitations; 3 semester credits. (Formerly 41-b, 42-c)

71, 72. STUDIES IN MODERN FRENCH LITERATURE. This course will take up several of the greatest French writers from 1600 to 1900 for a detailed and comprehensive study of their work. The choice of writers to be studied in a given year will depend upon the needs or tastes of the students electing the course. The work will be conducted largely in French. Assistant Professor Grigaut.

Prerequisite: Senior or graduate standing. 3 recitations; 3 semester credits. (Formerly 54-a, 55-b, 56-c)

FRENCH-EDUCATION (FR-ED) 81. PROBLEMS IN THE TEACHING OF FRENCH IN THE HIGH SCHOOL. This course will study the special objectives, methods, and problems of high school French. It is open only to Seniors and to graduate students who are planning to teach. Visits to schools to observe the work of experienced teachers will be arranged. Students in this course may be given an opportunity to assist in the work of French 1, 2. Mr. Floyd.

Prerequisite: Permission of the head of the department. 3 recitations; 3 semester credits. (Formerly Fr-Ed 161-a)

### COURSES FOR GRADUATE STUDENTS ONLY

101, 102. STUDIES IN FRENCH LITERATURE OF THE MIDDLE AGES AND THE RENAISSANCE. A seminar course which will take up several of the greatest French writers of the periods indicated, such as Chretien de Troyes, Villon, Rabelais, Ronsard, and Montaigne, for a detailed and comprehensive study of their work. Professor Parker.

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3 recitations ; 3 semester credits. (Given only when there is sufficient demand.) (Formerly 101-a, 102-b, 103-c)

107, 108. FOREIGN INFLUENCE ON FRENCH LITERATURE. A study of the influences of other countries upon French literature from the Middle Ages to the 19th century. Conducted largely in French. Assistant Professor Grigaut.

3 recitations ; 3 semester credits. (Given only when there is sufficient demand.) (Formerly 107-a, 108-b, 109-c)

### GERMAN

#### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. GERMAN LITERATURE. A survey of German literature. Readings, themes and reports on outside readings. Lectures and quizzes. Assistant Professor Hering.

Prerequisite: Three years of college German or equivalent. 3 recitations ; 3 semester credits. (Given in alternate years ; not offered in 1936-37) (Formerly 16-a, 17-b, 18-c)

55, 56. DEUTSCHKUNDE. The history of German civilization. Assistant Professor Hering.

Prerequisite: Three years of college German or equivalent. 3 recitations ; 3 semester credits. (Given in alternate years ; offered in 1936-37) (Formerly 54-a, 55-b, 56-c)

### LATIN

#### COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

In order that graduate students may minor in Latin, the department offers each year two courses carrying graduate credit for approved students.

51, 52. PHILOSOPHY AND SATIRE. Particular attention will be paid to the study of the philosophy, religion, natural science and social theories of the Romans, as exemplified in the writings of Horace, Martial, and Cicero. Associate Professor Walsh.

## GRADUATE SCHOOL

Prerequisite: Latin 8. 3 recitations; 3 semester credits.  
(Given in alternate years; not offered in 1936-37) (Formerly 7-a, 8-b, 9-c)

55, 56. LITERATURE AND HISTORY. This course offers a comprehensive view of Latin literature of the Golden Age. The works of Caesar, Cicero, and Virgil will be analyzed for their literary value and historical content. The history of Rome during the Golden Age will be studied in order to provide the background necessary to the student or teacher of the classics. Associate Professor Walsh.

Prerequisite: Latin 8. 3 recitations; 3 semester credits.  
(Given in alternate years; offered in 1936-37) (Formerly 10-a, 11-b, 12-c)

63, 64. LATIN COMPOSITION AND TEACHING METHODS. Translation of English narrative, beginning with the fundamentals of grammar and progressing to a study of prose style and effective idiomatic expression. Discussion of the best methods of presenting material to a class. Associate Professor Walsh.

Prerequisite: Permission of instructor or of head of department. 3 recitations; 3 semester credits. (Formerly 13-a, 14-b, 15-c)

## MATHEMATICS

HERMON L. SLOBIN, *Professor*

WALTER E. WILBUR, *Associate Professor*

MARVIN R. SOLT, *Assistant Professor*

MILTIADES S. DEMOS, *Assistant Professor*

WILLIAM L. KICHLINE, *Instructor*

## COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. ADVANCED CALCULUS, DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS AND THEIR APPLICATIONS TO ENGINEERING PROBLEMS. Assistant Professor Solt.

Prerequisite: Mathematics 8. 3 recitations; 3 semester credits. (Formerly 10-a, 11-b, 12-c)

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55, 56. ADVANCED PLANE AND SOLID ANALYTICAL GEOMETRY. Professor Slobin.

Prerequisite: Mathematics 8. 3 recitations; 3 semester credits. (Given in alternate years; not offered in 1936-37) (Formerly 30-a 31-b, 32-c)

57. THE HISTORY OF MATHEMATICS. This course is designed especially for those preparing to teach mathematics in the high schools. It aims to give an historical background and an appreciation of the development of various fields of mathematics. Associate Professor Wilbur.

Prerequisite: Mathematics 4 or 7. 3 recitations; 3 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 14-b, 15-c)

61, 62. SEQUENCES AND SERIES. An introduction to advanced analysis. Professor Slobin.

Prerequisite: Mathematics 8. 3 recitations; 3 semester credits. (Formerly 50-a, 51-b, 52-c)

71, 72. ADVANCED ALGEBRA. The following topics will be treated in this course: matrix theory, including elementary divisors and invariant factors; linear transformations; quadratic, bilinear and Hermitian forms; invariants and covariants with geometric applications; and topics from the theory of equations, including symmetric functions, and groups of substitutions. Assistant Professor Demos.

Prerequisite: Mathematics 8. 3 recitations; 3 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 80-a, 81-b, 82-c)

MATHEMATICS-EDUCATION (MATH-ED) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL MATHEMATICS. A study of the aims and values of secondary school mathematics, the recommendations of the national committee on mathematics requirements, and the state board requirements; also a study of the subject-matter and the sequence in which it should be presented in both junior and senior high schools, and the various techniques used in teaching secondary school mathematics. Errors, testing program and remedial teaching will be included. Lectures, assigned readings and discussion. Associate Professor Wilbur.

## GRADUATE SCHOOL

Prerequisites: Mathematics 8 or 34 and 4. Students preparing to teach mathematics in high school should register for this course. 3 recitations; 3 semester credits. (Formerly Math-Ed 161-a)

### COURSES PRIMARILY FOR GRADUATE STUDENTS

101. SELECTED TOPICS IN THE THEORY OF FUNCTIONS OF A REAL VARIABLE. Professor Slobin.

Prerequisite: Mathematics 8. 3 recitations; 3 credits. (Formerly 61-b)

102. SELECTED TOPICS IN THE THEORY OF FUNCTIONS OF A COMPLEX VARIABLE. Assistant Professor Demos.

Prerequisite: Mathematics 8. 3 recitations; 3 semester credits. (Formerly 70-a 71-b)

### SOCIAL STUDIES

HARRY W. SMITH, *Professor of Economics*

HERBERT F. RUDD, *Professor of Philosophy*

CHARLES W. COULTER, *Professor of Sociology*

THORSTEN V. KALIJARVI, *Associate Professor of Political Science*

ADOLPH G. EKDAHL, *Associate Professor of Psychology*

CLAIR W. SWONGER, *Assistant Professor of Economics*

LLEWELYN A. CRAMER, *Assistant Professor of Sociology*

ERWIN W. BARD, *Instructor of Political Science*

The close relationship of the subject matter of the various departments hereunder included make it advantageous to a strong program of graduate study to group the work under the heading of "Social Studies." Important problems do not of necessity follow departmental lines. A student may wish to study governmental control of business which takes him into the departments of economics and politics. Another may pursue a problem of ethical development which will take him into philosophy, psychology or sociology. Coöperation between allied departments offers decided advantages both in breadth and thoroughness of training. The courses offered below make it possible for the student to concentrate in one or two fields, while at the same time they present him with the opportunity of gaining a broad train-

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ing in human relations. A student who majors in this work will receive the degree of Master of Arts in Social Studies.

While it is impossible to set up precise qualifications for entering upon work in the field of Social Studies, general standards must be met by the candidate. He should have substantial beginning equivalent to an undergraduate major in some one or a combination of social subjects, or else be prepared at the recommendation of the Committee of the Social Studies to take basic elementary undergraduate courses without credit. He should also satisfactorily demonstrate to the committee that he has a definite purpose in undertaking graduate work. He will be required to take as a minimum one year's work in each of three of the social sciences.

### *ECONOMICS*

- 51. LABOR PROBLEMS.  
3 semester credits. (Formerly 10-a)
- 52. PUBLIC FINANCE.  
3 semester credits. (Formerly 12-c)
- 53, 54. MONEY AND BANKING.  
3 semester credits. (Formerly 13-a, 14-b, 15-c)
- 55, 56. CORPORATIONS.  
3 semester credits. (Formerly 22-a, 23-b)
- 57, 58. HISTORY OF ECONOMICS.  
3 semester credits. (Formerly 34-a, 35-b, 36-c)
- 59, 60. SEMINAR IN CURRENT ECONOMIC PROBLEMS.  
3 semester credits. (Formerly 40-a, 41-b, 42-c)

### *PHILOSOPHY*

- 50. THE ART OF THINKING: LOGIC.  
3 semester credits. (Formerly 43-c)
- 81. MAJOR MOVEMENTS IN EUROPEAN PHILOSOPHY.  
3 semester credits. (Formerly 31-a, 32-b)
- 82. MAJOR SYSTEMS AND PROBLEMS OF CURRENT PHILOSOPHY..  
3 semester credits. (Formerly 33-c)

## GRADUATE SCHOOL

83. THE EVOLUTION OF SOCIAL VALUES AND ETHICAL JUDGMENTS.  
3 semester credits. (Formerly 41-a)
84. ETHICAL PROBLEMS OF TODAY.  
3 semester credits. (Formerly 42-b)
- 85, 86. THE PHILOSOPHY AND CULTURE OF THE FAR EAST.  
3 semester credits. (Formerly 44-a, 45-b, 46-c)
- 87, 88. SEMINAR: SPECIAL PROBLEMS IN PHILOSOPHY.  
Credit to be arranged. (Formerly 54-a, 55-b, 56-c)

## *POLITICAL SCIENCE*

51. CONSTITUTIONAL LAW.  
3 semester credits. (Formerly 56-a, 57-b)
52. JURISPRUDENCE.  
3 semester credits. (Formerly 58-c)
- 53, 54. POLITICAL THEORY.  
3 semester credits. (Formerly 75-a, 76-b, 77-c)
- 55, 56. INTERNATIONAL RELATIONS AND WORLD GOVERNMENT.  
3 semester credits. (Formerly 78-a, 79-b, 80-c)

## *PSYCHOLOGY*

- 57, 58. EXPERIMENTAL PSYCHOLOGY.  
3 semester credits. (Formerly 37-a, 38-b, 39-c)
61. ABNORMAL PSYCHOLOGY.  
3 semester credits. (Formerly 49-c)
62. MENTAL HYGIENE.  
3 semester credits. (Formerly 27-b)
65. PHYSIOLOGICAL PSYCHOLOGY.  
3 semester credits. (Formerly 47-a)
66. COMPARATIVE PSYCHOLOGY.  
3 semester credits. (Formerly 48-b)
68. SYSTEMATIC PSYCHOLOGY.  
3 semester credits. (Formerly 23-c)
- 71, 72. SEMINAR.  
3 semester credits. (Formerly 51-a, 52-b, 53-c)

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## SOCIOLOGY

71. CRIME AND ITS SOCIAL TREATMENT.  
3 semester credits. (Formerly 75-a, 76-c)
72. THE FAMILY.  
3 semester credits. (Formerly 78-a, 79-b)
75. METHODS OF SOCIAL RESEARCH.  
3 semester credits. (Formerly 81-a, 82-b)
76. PRINCIPLES OF SOCIAL CASE WORK.  
3 semester credits. (Formerly 83-c)
83. SOCIAL WORK ORGANIZATION AND ADMINISTRATION.  
3 semester credits. (Formerly 77-c)
84. METHODS OF SOCIAL PROGRESS.  
3 semester credits. (Formerly 80-c)
- 89, 90. DEVELOPMENT OF SOCIAL THOUGHT.  
3 semester credits. (Formerly 100-a, 101-b, 102-c)
- 95, 96. SOCIOLOGICAL RESEARCH.  
3 semester credits. (Formerly 106-a, 107-b, 108-c)

## ZOOLOGY

C. FLOYD JACKSON, *Professor*  
ALMA D. JACKSON, *Associate Professor*  
EDYTHE T. RICHARDSON, *Assistant Professor*  
RUTH E. THOMPSON, *Instructor*  
CLYDE W. MONROE, *Instructor*  
W. ROBERT EADIE, *Instructor*  
ELEANOR L. SHEEHAN, *Instructor*

## COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

51, 52. INVERTEBRATE ZOÖLOGY. A study of the structure, habits, and ecological relationships of the different groups of invertebrate animals.

Given at the Isles of Shoals Marine Laboratory during the summer session. (Formerly 22-a, 23-b, 24-c)



## GRADUATE SCHOOL

53, 54. HISTOLOGY. A study of microscopical anatomy.

Prerequisites: Two years' work in Zoölogy and permission of the instructor. 3 recitations; 1 laboratory; 4 semester credits. (Formerly 36-a, 37-b, 38-c)

55, 56. EMBRYOLOGY. The study of type forms illustrating the fundamental principles of the embryonic development of animals.

Prerequisites: Three years' work in Zoölogy and permission of the instructor. 3 recitations; 1 laboratory; 4 semester credits. (Formerly 39-a, 40-b, 41-c)

57, 58. MICROSCOPICAL TECHNIQUE. A laboratory course in the methods used in the preparation of microscope slides, mounting embryos, making serial sections, etc. Will be adapted to individual needs as far as possible.

Prerequisites: A course in Histology, Cytology, Neurology, Embryology, or any of these courses carried as parallel work, and permission of the instructor. 1 recitation; 2 laboratories; 3 semester credits. (Not open to students who have had 54-a, 55-b, 56-c)

59, 60. ADVANCED PHYSIOLOGY. An advanced study of human physiology with special emphasis on nutrition, circulation, respiration, excretion, and secretion. The work will consist of lectures, assigned readings and laboratory experiments.

Prerequisite: Two years' work in Zoölogy. 3 recitations; 1 laboratory; 4 semester credits. (Formerly 42-a, 43-b, 44-c)

61, 62. CYTOLOGY AND GENETICS. A detailed study of the cell, including morphology, the chemical and physical nature of protoplasm, mitosis, meiosis, syngamy, and related phenomena leading up to the physical basis of inheritance and the study of Mendel's laws, the expression and interaction of the genes, linkage, sex and its inheritance, the inheritance of quantitative characters, and the types and causes of variations.

Prerequisite: Two years' work in Zoölogy. 3 recitations; 1 laboratory; 4 semester credits. (Given in alternate years; offered in 1936-37) (Formerly 48-a, 49-b, 50-c)

63, 64. NEUROLOGY. A comparative study of the nervous system of the lower animals and a detailed study of the morphology, physi-

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ology, and histology of the human nervous system. The subject is intended to give a practical knowledge of the nervous system and its operation.

Prerequisite: Two years' work in Zoölogy. 3 recitations; 1 laboratory; 4 semester credits. (Given in alternate years; not offered in 1936-37) (Formerly 51-a, 52-b, 53-c)

BIOLOGY-EDUCATION (BIOL-ED) 91. PROBLEMS IN THE TEACHING OF HIGH SCHOOL BIOLOGY. Materials and methods in presenting the subject of biology in secondary schools and introductory college courses will be discussed. There will also be a general survey of the field of biology for the purpose of correlating the various lines of work previously studied.

Given at the Isles of Shoals Marine Laboratory during the summer session.

97, 98. SPECIAL PROBLEMS. Advanced students may elect this work provided they present a detailed outline of the problems which they wish to investigate and, furthermore, provided they can furnish adequate proof of their ability to carry the problem in view of their past training and the equipment available.

Credits to be arranged. (Formerly 99-a, -b, -c)

### COURSES PRIMARILY FOR GRADUATE STUDENTS

101, 102. ADVANCED TAXONOMY. Critical examination of selected groups of vertebrates and invertebrates with special reference to local forms, their classification, distribution, and phylogeny.

Prerequisite: Three years' work in Zoölogy. 2 recitations; 2 laboratories; 4 semester credits. (Formerly 80-a, 81-b, 82-c)

103, 104. ADVANCED VERTEBRATE ECOLOGY. A study of advanced ecological problems and their correlation with morphology, physiology, and taxonomy as exemplified by local associations and cenoses.

Prerequisite: Three years' work in Zoölogy. 2 recitations; 2 laboratories; 4 semester credits. (Formerly 86-a, 87-b, 88-c)

GRADUATE SCHOOL  
GRADUATE STUDENTS

(Men, 33; Women, 13; Total, 46)

NAME	COURSE	P.O. ADDRESS
Baldwin, Shirley Elizabeth B.A., New Hampshire, 1935	<i>Major French</i>	<i>East Kingston</i>
Bennett, Stanley Andrews Th.B., Gordon College, 1932 B.D., Andover-Newton Theological School	<i>Major Social Studies</i>	<i>W. Lebanon, Me.</i>
Bourn, Alger Stedman B.S., Yale, 1930 M.S., M.I.T., 1931	<i>Major Education</i>	<i>Exeter</i>
Burleigh, Joseph B.S., Dartmouth, 1924	<i>Major Education</i>	<i>Franklin</i>
Carroll, Newton LeRoy B.A., New Hampshire, 1933 M.A., New Hampshire, 1934	<i>Major Education</i>	<i>Dover</i>
Chamberlin, William Coleman B.A., Yale, 1933	<i>Major Social Studies</i>	<i>Durham</i>
Clark, Guy Harlan B.E., Keene Normal, 1931	<i>Major Education</i>	<i>Manchester</i>
Cournoyer, Madeleine Albina A.B., Brown, 1935	<i>Major French</i>	<i>Suncook</i>
Deene, Kenneth Leslie B.S., New Hampshire, 1935	<i>Major History</i>	<i>Exeter</i>
Dickey, Edna Frances B.A., New Hampshire, 1933	<i>Major History</i>	<i>Salem</i>
Douglas, Earle William Th.B., Gordon College, 1935	<i>Major Social Studies</i>	<i>Hampton</i>
Doyle, Mildred Linfield B.S., New Hampshire, 1935	<i>Major Education</i>	<i>Concord</i>
Ernst, Grace Lorene B.S., New Hampshire, 1935	<i>Major Chemistry</i>	<i>Manchester, Mass.</i>
Evans, Nell Wysor B.S., Boston University, 1935	<i>Major Education</i>	<i>Christiansburg, Va.</i>
Fernald, Elizabeth A.B., Tufts, 1929	<i>Major Education</i>	<i>Nottingham</i>

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NAME	COURSE	P.O. ADDRESS
French, Kendrick Stephen B.S., New Hampshire, 1935	<i>Major Chemistry</i>	<i>Center Barnstead</i>
Glazier, Priscilla B.A., New Hampshire, 1934	<i>Major English</i>	<i>Salem</i>
Gray, Roger Davis B.S., New Hampshire, 1934	<i>Major Chemistry</i>	<i>Dover</i>
Gregg, Donald Crowther B.S., Vermont, 1935	<i>Major Chemistry</i>	<i>Westminster West, Vt.</i>
Hangen, Emerson Grabill A.B., Albright, 1922	<i>Major Social Studies</i>	<i>Portsmouth</i>
Johnson, Ruth Helen B.S., New Hampshire, 1934	<i>Major Geology</i>	<i>East Jaffrey</i>
Jorgenson, Arthur Malcolm B.S., New Hampshire, 1935	<i>Major Botany</i>	<i>Winthrop, Mass.</i>
Lapeza, Terry Frank B.S., New Hampshire, 1935	<i>Major Education</i>	<i>Nashua</i>
Leavitt, Harold Irving B.S., New Hampshire, 1921	<i>Major Education</i>	<i>Durham</i>
Lowney, Mary M B.S., Montana State, 1933	<i>Major Social Studies</i>	<i>Butte, Montana</i>
McEgan, Helen Margaret B.S., New Hampshire, 1934	<i>Major English</i>	<i>Laconia</i>
Markos, Basil George B.S., New Hampshire, 1934 M.S., New Hampshire, 1935	<i>Major Entomology</i>	<i>Dover</i>
Mathews, Carroll Elwyn B.A., New Hampshire, 1935	<i>Major Social Studies</i>	<i>Rochester</i>
Maxam, Eugene Charles B.S., New Hampshire, 1926	<i>Major Psychology</i>	<i>Concord</i>
Moriarty, Maurice James B.A., New Hampshire, 1935	<i>Major Social Studies</i>	<i>Durham</i>
O'Leary, Maurice John B.A., New Hampshire, 1928	<i>Major Education</i>	<i>Rochester</i>
Peckham, Warren Francis B.S., New Hampshire, 1933	<i>Major Chemistry</i>	<i>Concord</i>
Phaneuf, Paul Hubert Ph.B., Holy Cross, 1935	<i>Major Education</i>	<i>Nashua</i>

## GRADUATE SCHOOL

NAME	COURSE	P.O. ADDRESS
Rafferty, Terrence John B.A., New Hampshire, 1934	<i>Major French</i>	<i>Portsmouth</i>
Raitt, Lorraine Estelle B.A., New Hampshire, 1935	<i>Major French</i>	<i>Derry Village</i>
Roe, Bernice C B.A., Delaware, 1932	<i>Major History</i>	<i>Dover</i>
Shuman, C. Kenneth B.S., Ohio State, 1935	<i>Major A.S.B. Chemistry</i>	<i>Fletcher, Ohio</i>
Sillers, Ernest Dwyer Th.B., Gordon College, 1935	<i>Major Social Studies</i>	<i>Seabrook</i>
Slayton, Foster Herbert B.S., New Hampshire, 1928	<i>Major Psychology</i>	<i>Portsmouth</i>
Stevens, John Murray B.S., Holy Cross, 1931	<i>Major Education</i>	<i>Portsmouth</i>
Sulloway, Alexander Mark B.S., New Hampshire, 1935	<i>Major History</i>	<i>Berlin</i>
Terrill, Roy Leslie B.S., New Hampshire, 1933	<i>Major Social Studies</i>	<i>Lakeport</i>
Toft, Sherman Ward B.A., New Hampshire, 1934	<i>Major French</i>	<i>Exeter</i>
Waananen, Arvi Olavi B.S., New Hampshire, 1935	<i>Major Civil Engineering</i>	<i>Concord</i>
Wood, Winchester Ridout B.S., New Hampshire, 1930	<i>Major Mathematics</i>	<i>Lebanon</i>
Wright, Lemuel Dary B.S., New Hampshire, 1935	<i>Major Chemistry</i>	<i>Nashua</i>





